

EVERYDAY MATHEMATICS®
UCSMP GRADES 6–12
CURRICULUM ALIGNMENT



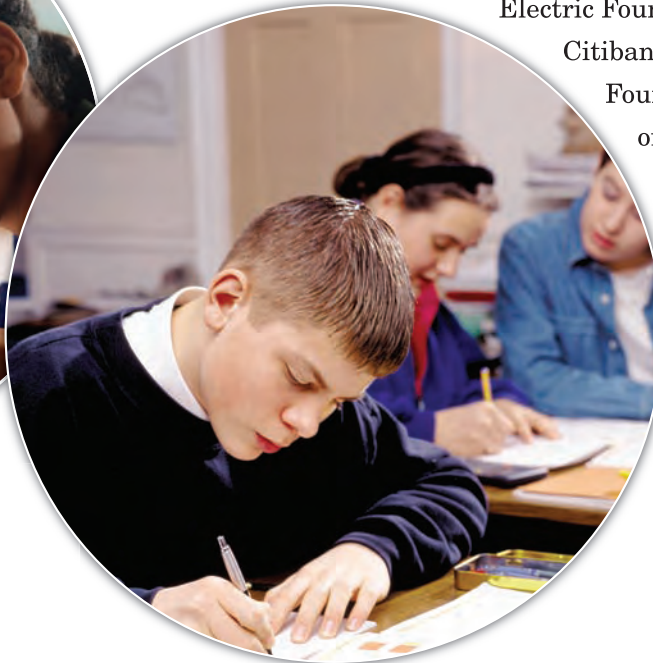
The University of Chicago School Mathematics Project



The University of Chicago School Mathematics Project (UCSMP) developed *Everyday Mathematics* in order to enable students in elementary grades to learn more mathematical content and become life-long mathematical thinkers. *UCSMP Grades 6–12* continues this philosophy for middle school and high school, extending the concept development and skills students learned in the elementary grades to develop the logic and mathematical understanding all students need to be proficient mathematical thinkers. Therefore, the UCSMP project offers a continuous Pre-K through Grade 12 curriculum with an articulated sequence of conceptual understanding, skill development, problem solving, and reasoning.

This curriculum reflects more than 20 years of research, development, and proven results. Now in their Third Editions, *Everyday Mathematics* Pre-K–6 and *UCSMP Grades 6–12* are the only mathematics programs that offer a unified and coherent Pre-K–12 curriculum developed with collaborative author teams.

Substantial and long-term funding for the project has been provided by the Amoco Foundation, the National Science Foundation, Ford Motor Company, the Carnegie Corporation of New York, the Stuart Foundation, the General Electric Foundation, GTE, Citicorp/Citibank, the Exxon Educational Foundation, the Illinois Board of Higher Education, and the Chicago Public Schools.



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UCSMP Grades 6–12 Project Goals

The *Everyday Mathematics* instructional design was carefully crafted to capitalize on student interest and maximize student learning.

EVERYDAY MATHEMATICS INSTRUCTIONAL DESIGN

- High expectations for all students
- Concepts and skills developed over time and in a wide variety of contexts
- Balance among mathematical strands
- Dynamic applications
- Multiple methods and strategies for problem solving
- Concrete modeling as a pathway to abstract understanding
- Collaborative learning in partner and small-group activities
- Cross-curricular applications and connections

The *Everyday Mathematics* instructional design flows seamlessly into the three major goals of the *UCSMP Grades 6–12* mathematics curricula.

UCSMP GRADES 6–12 GOALS

GOAL 1 The curriculum seeks to upgrade student achievement. Years of research on the materials confirm improved student performance.

GOAL 2 The curriculum must be up to date, including today's calculator and computer technology; inclusion of statistical ideas throughout the middle and secondary school years; more discrete mathematics so students are prepared for jobs in computer related industries; and applications must permeate the materials.

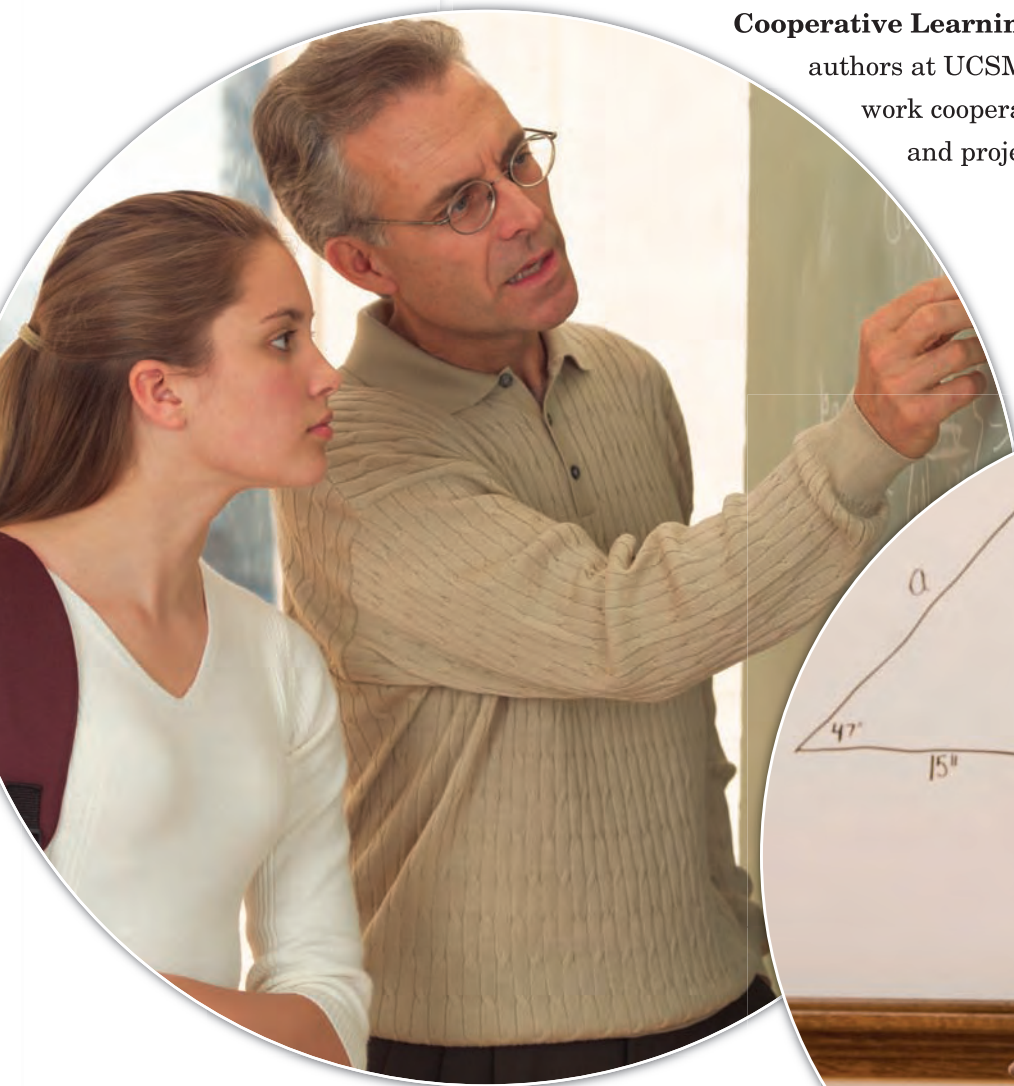
GOAL 3 Increase the number of students who take mathematics beyond algebra and geometry. Moreover, with the proper materials, algebra should be the general course of study for all or most eighth grade students.

Preparing Students for Success

The UCSMP programs provide developmental curricula to make students competitive in the international arena and well-prepared for life after high school. The elementary and secondary programs challenge students to stretch their potential, providing all students with the necessary support to ensure they receive the best mathematics education for their individual needs.

The cohesiveness and continuity of the two programs are evident when comparing the grade-level curricula for *Everyday Mathematics* with *Transition Mathematics* and *Pre-Transition Mathematics*. Additionally, there is continuity in instructional methodology and management strategies. Following are a few pillars of the UCSMP mathematics programs that are continuously present in Pre-Kindergarten *Everyday Mathematics* through *Precalculus* and *Discrete Mathematics* in the secondary program.

Cooperative Learning Students learn best from their peers. The authors at UCSMP ensure that students have opportunities to work cooperatively, including games, activities, explorations, and projects.



Content Repetition Mastery of content is certainly something that all teachers would like for their students to attain. The UCSMP programs provide a spiraling curriculum, repeating content throughout each school year and course, bringing topics back to be refreshed, reinforced, and extended. Students learn concepts, strategies, and skills at different times and in different contexts. With time and repeated exposure, students learn the content.

Reading to Learn Mathematics The UCSMP programs help students read and comprehend mathematics. Knowing how to read technical matter is an essential skill in the information and technology era. Starting with the *My Reference Book* and *Student Reference Books* in *Everyday Mathematics*, students get into the habit of reading mathematical text early in their study of mathematics. This continues through the secondary courses as students are expected to read the mathematical text in their math books.

Technology Universities and the business world require that students leave high school with a working knowledge of computers and calculators. The UCSMP programs get students working with spreadsheets and calculators at a young age, adding in computer algebra systems and dynamic geometry systems in high school.

Real-World Problem Solving Problems oriented in the real world add meaning to mathematics. Applications of skills and procedures make mathematics accessible and valuable to students who want to know why they need to study mathematics.



The *UCSMP* Grades 6–12 Philosophy

UCSMP Grades 6–12 Overview

Development and testing of UCSMP program materials for Pre-K–12 started in 1983. Field testing and revisions have continued ever since, resulting in the Third Editions of this comprehensive Pre-K–12 mathematics program. The *UCSMP* Grades 6–12 program emphasizes the following features and benefits.

KEY PROGRAM FEATURES	ADVANTAGES	BENEFITS
ENRICHED CONTENT Wider scope of mathematical content than traditional programs including more statistics in every level, and transformational geometry at every level	A bridge between algebraic functions and geometric representation	Upgrades student achievement providing continual opportunities for problem solving
PROBLEM SOLVING Continual emphasis on problem solving with real-world application	Up-to-date curriculum which develops connections to other disciplines	Students are better prepared for jobs in computer related/technology-based industries
TECHNOLOGY All teachers and students in all courses will be expected to have access to graphing calculators, both in class and for assignments	Up-to-date use of calculators and computers	Real world experiences and greater understanding of technology
FOUR DIMENSIONS OF UNDERSTANDING The SPUR approach: Skills, Properties, Uses, Representations	The unique four-dimensional approach to understanding	Maximizes student performance and fosters independent learning

UCSMP Grades 6–12 Highlights

In response to various international, national, and state tests since the 1980s, combined with years of research and performance data, the UCSMP project has created the Third Edition *UCSMP* Grades 6–12 courses to address the most current issues in middle school and high school mathematics education.

Guided Instruction and Active Learning Students learn best when classes are active and dynamic, presenting information through various modes and mediums. Students also learn at different rates and through repeated exposure to topics. From Pre-Kindergarten *Everyday Mathematics* all the way through *Precalculus and Discrete Mathematics*, teachers guide students through lessons, activities, and projects that engage students in collaborative discovery of concepts and ideas. Continuous opportunities for review help students master concepts.

New Technology The use of technology – including calculators, graphing calculators, dynamic geometry systems, spreadsheets, the Internet, computer algebra systems (CAS), and other computer applications – is an essential component of the Third Editions of both UCSMP programs. Keeping current with modern technology will ensure that our students are well-prepared for the information age.

Real-World Applications UCSMP uses real-world applications to introduce and develop concepts in lessons from Pre-K *Everyday Mathematics* through *Precalculus and Discrete Mathematics*. Skills that students learn through games and routines in *Everyday Mathematics* are put to the test through dynamic cross-curricular applications in the *UCSMP Grades 6–12* courses so students at various points of understanding can access the mathematics and continue to develop their understanding.

Reading and Writing Mathematics Reading mathematical text is required throughout both UCSMP programs, starting with the *My Reference Book* and *Student Reference Books* in *Everyday Mathematics* and extending through all of the *UCSMP Grades 6–12* courses. Students must learn to read and write mathematical language in order to fully understand and communicate mathematical concepts. The familiarity with vocabulary and symbols that develops as students learn to read and write mathematical text will allow students to use any mathematical texts, not just their text books, as tools for understanding.

Multi-dimensional Approach to Understanding *UCSMP Grades 6–12* uses the following multi-dimensional approach to understanding. The SPUR approach to understanding builds on the differentiated instruction built into *Everyday Mathematics*, providing continuous support to students despite their particular level of understanding.

SKILLS

Skills understanding means knowing a way to obtain a solution.

PROPERTIES

Properties understanding means knowing properties which you can apply. (Identify or justify the steps in obtaining answer.)

USES

Uses understanding means knowing situations in which you could apply the solving of this equation. (Set up or interpret a solution.)

REPRESENTATIONS

Representations understanding means having a representation of the solving process or a graphical way of interpreting the solution.

The Research Behind UCSMP Curricula

International and national studies of student performance, mathematics texts, and mathematics curricula in the early 1980s indicated that mathematics education in the United States was failing. Our students were paying the price by falling behind in international standings and being under qualified for college and the job market. These studies sparked an interest in improving the quality of education students in the United States receive in grades K–12, especially in the areas of mathematics and science. Emphasis was placed on modern technology, new instructional methods, multiple learning modalities, and a more rigorous and demanding curriculum. As a result, students in the United States have improved on international tests and are leaving high school better prepared for the real world.

But all has not been resolved. Too many students in the United States continue to leave high school having taken fewer mathematics courses than comparable students in other countries, and they have still not caught up with modern technology or expectations coming from the business world. We have made progress, but there is still progress to be made.

EVERYDAY MATHEMATICS & UCSMP GRADES 6–12 TIMELINE OF RESEARCH AND DEVELOPMENT											
	Pre-1989	1989	1990	1991	1992	1993	1994	1995	1996	1997	
EVERYDAY MATHEMATICS	Pre-K										
	Kindergarten	PUBLISH								FEEDBACK • WRITE • FIELD-TEST	
	Grade 1	WRITE • FIELD-TEST REWRITE • PUBLISH								◆	
	Grade 2		WRITE • FIELD-TEST • REWRITE • PUBLISH							◆	
	Grade 3			WRITE • FIELD-TEST • REWRITE • PUBLISH						◆	
	Grade 4				WRITE • FIELD-TEST • REWRITE • PUBLISH						
	Grade 5					WRITE • FIELD-TEST • REWRITE • PUBLISH					
	Grade 6						WRITE • FIELD-TEST • REWRITE • PUBLISH				
UCSMP GRADES 6–12	Pre-Transition Mathematics										
	Transition Mathematics	WRITE • FIELD-TEST REWRITE • PUBLISH			FEEDBACK • WRITE • FIELD-TEST PUBLISH – 2ND EDITION						
	Algebra	WRITE • FIELD-TEST REWRITE • PUBLISH			FEEDBACK • WRITE • FIELD-TEST PUBLISH – 2ND EDITION						
	Geometry	WRITE • FIELD-TEST • REWRITE PUBLISH – 1ST EDITION			FEEDBACK • WRITE • FIELD-TEST PUBLISH – 2ND EDITION						
	Advanced Algebra	WRITE • FIELD-TEST • REWRITE PUBLISH – 1ST EDITION			FEEDBACK • WRITE • FIELD-TEST PUBLISH – 2ND EDITION						
	Functions, Statistics, Trigonometry	WRITE • FIELD-TEST REWRITE • PUBLISH			FEEDBACK • WRITE • FIELD-TEST • PUBLISH – 2ND EDITION						
	Precalculus and Discrete Mathematics	WRITE • FIELD-TEST • REWRITE PUBLISH			FEEDBACK • WRITE • FIELD-TEST • PUBLISH – 2ND EDITION						

Field Testing

When UCSMP set out to develop a Pre-K–12 mathematics curriculum, each grade level and course was written with consideration for content and instructional standards set forth by the National Council of Teachers of Mathematics (NCTM) as well as current research on how students learn. Each and every program component was then field tested in actual schools, with actual students. Results of these field tests, including student success and teacher feedback, influenced revisions made before publication. The same process happened for each subsequent edition of the books, resulting in the Third Editions of *Everyday Mathematics* and *UCSMP Grades 6–12*.

		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
					FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH							
		PUBLISH – 2ND EDITION					▲	FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 3RD EDITION				
		FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 2ND EDITION					▲	FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 3RD EDITION				
		FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 2ND EDITION					▲	FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 3RD EDITION				
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		◆	FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 2ND EDITION				▲	FEEDBACK ♦ WRITE ♦ FIELD-TEST ♦ PUBLISH – 3RD EDITION				
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◆ = 1st edition update

▲ = 2nd edition update — electronic components added

Making the Transition

Transition Options

Both UCSMP programs, *Everyday Mathematics* and *UCSMP Grades 6–12*, were written with the same purpose at the foundation: to increase the quality and amount of mathematics that students learn before leaving high school so they are prepared for the workforce or post-secondary studies. Both the Pre-K–6 and 6–12 programs build upon the same national content and pedagogical standards and draw from the same research base. This is the only curriculum to provide a comprehensive curriculum for elementary grades through the end of high school.

The transition from *Everyday Mathematics* to *UCSMP Grades 6–12* can happen in multiple ways, depending on student and school needs. Following are two ways to seamlessly make the transition from *Everyday Mathematics* into *UCSMP Grades 6–12*.

Making the Switch Between 5th and 6th Grades

Districts using *Everyday Mathematics* through 5th grade can opt to start using the 6–12 program in 6th grade, with *Pre-Transition Mathematics*. Bridging the programs at this point seamlessly moves students into the secondary books due to connections between the scope and sequences of the two programs. Operations with fractions and decimals, concepts in probability and data analysis/displays, and relationships within and among 2- and 3-dimensional figures are learned and developed in grade 5 of *Everyday Mathematics* and then are extended and applied in *Pre-Transition Mathematics*.

This approach is especially effective for districts with elementary schools that run through 5th grade, succeeded by middle schools including 6th–8th grades.

Making the Switch Between 6th and 7th Grades

Districts using *Everyday Mathematics* through 6th grade can opt to start using the 6–12 program in 7th grade, with *Transition Mathematics*. Bridging the programs at this point maintains the vast connections between the scope and sequences of the programs, including more of an emphasis on statistics, algebraic concepts, and geometry in 3 dimensions.

A third transition option would be using *Everyday Mathematics* through 6th grade, followed by *Pre-Transition Mathematics* in 7th grade.

Students can enter the *UCSMP Grades 6–12* series at any grade but are advantaged by having had the previous UCSMP courses. The chart below shows how *Everyday Mathematics* and *UCSMP Grades 6–12* series can be used together.

	TOP 10-20% OF STUDENTS	NEXT 50% OF STUDENTS	NEXT 20% OF STUDENTS	REMAINDER OF STUDENTS
GRADE 5	EM Grade 5 or Pre-Transition Mathematics			
GRADE 6	Transition Mathematics	EM Grade 6 or Pre-Transition Mathematics		
GRADE 7	Algebra	Transition Mathematics	Pre-Transition Mathematics	
GRADE 8	Geometry	Algebra	Transition Mathematics	Pre-Transition Mathematics
GRADE 9	Advanced Algebra	Geometry	Algebra	Transition Mathematics
GRADE 10	Functions, Statistics, and Trigonometry	Advanced Algebra	Geometry	Algebra
GRADE 11	Precalculus and Discrete Mathematics	Functions, Statistics, and Trigonometry	Advanced Algebra	Geometry
GRADE 12	Calculus (Not available through UCSMP)	Precalculus and Discrete Mathematics	Functions, Statistics, and Trigonometry	Advanced Algebra

An Articulated Curriculum Across UCSMP Programs

The following charts show how the *Everyday Mathematics* grade 5 curriculum articulates with the *Pre-Transition Mathematics* curriculum, and how the *Everyday Mathematics* grade 6 curriculum articulates with the *Transition Mathematics* curriculum.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
NUMBER & OPERATIONS	NUMBER AND NUMERATION	
	1. Read and write numbers and decimals; identify places in such numbers and the values of the digits in those places; use expanded notation to represent whole numbers and decimals.	<ul style="list-style-type: none"> • Write word names for decimals, and vice versa. • Identify place values in a decimal number. • Translate back and forth from words into the decimal system. • Correctly use the raised-bar symbol for repeating decimals.
	2. Solve problems involving percents and discounts; describe and explain strategies used; identify the unit whole in situations involving fractions.	<ul style="list-style-type: none"> • Find the percent of a quantity.
	4. Use numerical expressions involving one or more of the basic core arithmetic operations, grouping symbols, and exponents to give equivalent names for whole numbers; convert between base-10, exponential, and repeated-factor notations.	<ul style="list-style-type: none"> • Find the percent of a quantity in real-world situations.
	5. Use numerical expressions to find and represent equivalent names for fractions, decimals, and percents; use and explain multiplication and division rules to find equivalent fractions and fractions in simplest form; convert between fractions and mixed numbers; convert between fractions, decimals, and percents.	<ul style="list-style-type: none"> • Rewrite numbers in base-10 using exponents. • Calculate the values of and simplify expressions with exponents.
	6. Compare and order rational numbers; use area models, benchmark fractions, and analyses of numerators and denominators to compare and order fractions and mixed numbers; describe strategies used to compare fractions and mixed numbers.	<ul style="list-style-type: none"> • Given a simple fraction, write other fractions equal to it. • Rewrite improper fractions as mixed numbers. • Recognize the Equal Fractions Property and the meaning of a fraction in terms of division. • Convert among fractions, decimals, and percents. • Convert between the language of fractions and the language of division. • Tell whether a fraction equals a terminating or repeating decimal. • Understand and use the Ratio Comparison Model for Division. • Use the Ratio Comparison Model to compare two quantities as percents. • Find percents of quantities in real situations.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
NUMBER & OPERATIONS	OPERATIONS AND COMPUTATION	
	1. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the addition and subtraction of whole numbers, decimals, and signed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Add positive and negative numbers. • Picture addition of positive and negative numbers on a number line. • Subtract positive and negative integers, fractions, and mixed numbers. • Use the Putting-Together Model for Addition in real-world situations. • Use the Slide Model for Addition. • Picture subtraction of positive and negative numbers on a number line. • Use the Add-Opp Property to rewrite subtraction problems as addition problems.
	2. Demonstrate automaticity with multiplication facts and proficiency with division facts and fact extensions.	<ul style="list-style-type: none"> • Multiply by 10, $\frac{1}{10}$, 100, $\frac{1}{100}$, 1000, $\frac{1}{1000}$, and so on. • Use fact triangles to find related facts for addition and subtraction. • Find answers to whole-number divisions. • Use fact triangles to solve equations and show relationships involving multiplication and division.
	3. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the multiplication of whole numbers and decimals and the division of multidigit whole numbers and decimals by whole numbers; express remainders as whole numbers or fractions as appropriate; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Write the answer to a division problem as a mixed number. • Multiply decimals. • Find answers to whole-number divisions. • Divide by small whole numbers using short division. • Use whole number division in real situations. • Use decimal division in real situations. • Round any decimal to the indicated degree of accuracy. • Multiply positive and negative numbers. • Divide positive and negative numbers. • Use the rate model for division. • Generate random numbers. • Use division with positive and negative numbers in real situations. • Find quotients in rational number and decimal divisions.
	4. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the addition and subtraction of fractions and mixed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Add fractions and mixed numbers. • Use fractions to add mixed numbers or numbers with mixed units in real-world situations.
	5. Use area models, mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the multiplication of fractions and mixed numbers; use diagrams, a common-denominator method, and calculators to solve problems involving the division of fractions; describe the strategies used.	<ul style="list-style-type: none"> • Multiply fractions and mixed numbers. • Apply the Property of Reciprocals. • Use division of fractions and mixed numbers in real situations. • Represent the multiplication of a sum by areas. • Divide fractions and mixed numbers using reciprocals. • Multiply fractions in real-world situations.
	7. Use repeated addition, arrays, area, and scaling to model multiplication and division; use ratios expressed as words, fractions, percents, and with colons; solve problems involving ratios of parts of a set to the whole set.	<ul style="list-style-type: none"> • Use arrays to picture divisibility. • Represent the multiplication of a sum by areas.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
ALGEBRA	PATTERNS, FUNCTIONS, AND ALGEBRA	
	2. Determine whether number sentences are true or false; solve open number sentences and explain the solutions; use a letter variable to write an open sentence to model a number story; use a pan-balance model to solve linear equations in one unknown.	<ul style="list-style-type: none"> • Solve equations involving addition and subtraction. • Apply simple equations involving addition or subtraction. • Use balance scales to picture equations. • Solve proportions. • Use equation of the form $a = xb$ to solve problems in life situations. • Use proportions in real situations.
	3. Evaluate numerical expressions containing grouping symbols and nested grouping symbols; insert grouping symbols and nested grouping symbols to make number sentences true; describe and use the precedence of multiplication and division over addition and subtractions.	<ul style="list-style-type: none"> • Evaluate numerical expressions using the correct order of operations.
	4. Describe and apply the properties of arithmetic.	<ul style="list-style-type: none"> • Identify and apply the following properties of addition: Commutative Property of Addition, Associative Property of Addition, Additive Identity Property of Zero, Additive Property of Opposites, and Opposite of Opposites Property. • Use the Addition Property of Equality to help solve simple equations. • Use the Take-Away Model for Subtraction. • Use the Comparison Model for Subtraction. • Use the Slide Model for Subtraction. • Identify the Commutative and Associative Properties of Multiplication. • Use the Array Model for Multiplication in real-world situations. • Solve equations of the form $a = xb$ using the Multiplication Property of Equality. • Know and apply the Substitution Principle for decimals and percents. • Apply the Mult.-Rec Property of Division.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
GEOMETRY	GEOMETRY	
	<p>1. Identify, describe, compare, name, and draw right, acute, obtuse, straight, and reflex angles; determine angle measures in vertical and supplementary angles and by applying properties of sums of angle measures in triangles and quadrangles.</p>	<ul style="list-style-type: none"> • Name and measure angles. • Apply the properties of angle addition. • Apply the Triangle-Sum Theorem and the Quadrilateral-Sum Theorem. • Given steps with diagrams, create a figure out of paper. • Relate simple paper folds to geometric figures. • Know relationships among linear pairs and vertical angles formed by intersecting lines. • Recognize acute, right, and obtuse angles, and complementary and supplementary angles. • Use properties of angles to find unknown measures of angles. • Find the measures of various angles created by a pair of parallel lines intersected by a transversal.
	<p>2. Describe, compare, and classify plane and solid figures using appropriate geometric terms; identify congruent figures and describe their properties.</p>	<ul style="list-style-type: none"> • Given three side lengths, determine if they make a triangle. • Given the side lengths and/or angle measures, draw a triangle. • Given side lengths and/or angle measures, draw a quadrilateral. • Construct perpendiculars to a line through a point. • Construct the perpendicular bisector of a segment. • Given the steps of a construction written in symbols, perform the construction and tell what has been constructed. • Given the information about side lengths and angle measures, determine if all triangles drawn would be congruent. • Use definitions and properties of quadrilaterals to indicate relationships among isosceles trapezoids, kites, parallelograms, rectangles, rhombuses, squares, and trapezoids. • Draw and interpret diagrams relating the various kinds of triangles and the various kinds of quadrilaterals.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
MEASUREMENT	MEASUREMENT AND REFERENCE FRAMES	
	1. Estimate length with and without tools; measure length with tools to the nearest $\frac{1}{8}$ inch and millimeter; estimate the measure of angles with and without tools; use tools to draw angles with given measures.	<ul style="list-style-type: none"> • Measure lengths in customary units. • Draw a line segment with a given length. • Draw and measure lengths in the metric system. • Name and measure angles.
	2. Describe and use strategies to find the perimeter of polygons and the area of circles; choose and use appropriate formulas to calculate the areas of rectangles, parallelograms, and triangles, and the volume of a prism; define π as the ratio of a circle's circumference to its diameter.	<ul style="list-style-type: none"> • Find the perimeter of a polygon. • Find areas in real-world situations. • Find the areas of a parallelograms, triangles, and circles. • Find the circumference of a circle. • Use addition and subtraction to calculate the areas of geometric figures formed from combinations of parallelograms, triangles, and circles. • Find the volume of a box. • Use the formula for the circumference of a circle in real situations. • Use the formulas for areas of parallelograms, triangles, and circles in real situations. • Name the faces, edges, and vertices of a box and give the dimensions for each face of a given box. • Draw and label a net for a given box. • Find the surface area of a box. • Use addition and subtraction to calculate areas formed by combining geometric figures in real situations.
	3. Describe relationships among U.S. customary units of length; among metric units of length; and among U.S. customary units of capacity.	<ul style="list-style-type: none"> • Rewrite mixed units using a single unit. • Add lengths in real-world situations. • Multiply positive and negative numbers in real-world situations. • Convert among metric units for mass, length, and capacity.
	4. Use ordered pairs of numbers to name, locate, and plot points in all four quadrants of a coordinate grid.	<ul style="list-style-type: none"> • Describe properties of points graphed on a coordinate grid. • Graph simple equations involving addition and subtraction on a coordinate grid. • Graph points on a coordinate grid. • Graph pairs of numbers from equal ratios or rates.

NCTM Strand	Everyday Mathematics Grade 5 Grade-Level Goals	Pre-Transition Mathematics SPUR Objectives
DATA ANALYSIS & PROBABILITY	DATA AND CHANCE	
	1. Collect and organize data or use given data to create bar, line, and circle graphs with reasonable titles, labels, keys, and intervals.	<ul style="list-style-type: none"> • Read and draw circle graphs. • Construct a histogram or stem-and-leaf plot. • Construct a circle graph by hand or by using technology. • Construct a line graph by hand or by using technology. • Differentiate between categorical and numerical data. • Create and interpret a double bar graph or double histogram.
	2. Use the maximum, minimum, range, median, mode, and mean and graphs to ask and answer questions, draw conclusions, and make predictions.	<ul style="list-style-type: none"> • Calculate the maximum value, minimum value, median, mode, mean, and range of a set of data. • Locate, use, and draw conclusions from data in a table. • Interpret information displayed in a histogram or stem-and-leaf plot. • Interpret information displayed in a circle graph. • Interpret information displayed in a line graph. • From data, obtain means, medians, and ranges, and compare distributions.
	3. Describe events using <i>certain</i> , <i>very likely</i> , <i>likely</i> , <i>unlikely</i> , <i>very unlikely</i> , <i>impossible</i> , and other basic probability terms; use <i>more likely</i> , <i>equally likely</i> , <i>same chance</i> , <i>50-50</i> , <i>less likely</i> , and other basic probability terms to compare events; explain the choice of language.	<ul style="list-style-type: none"> • Relate probability to the likelihood or unlikelihood of an event. • Find the size of a sample space.
	4. Predict the outcomes of experiments, test the predictions using manipulatives, and summarize the results; compare predictions based on theoretical probability with experimental results; use summaries and comparisons to predict future events; express the probability of an event as a fraction, decimal, or percent.	<ul style="list-style-type: none"> • Calculate the relative frequency for an event. • Find the probability of an event. • Use the Multiplication Counting Principle. • Use relative frequencies to estimate the probability of an event. • Understand the "Law of Large Numbers." • Find the probability of an event in a life situation. • Represent counting situations using lists and tree diagrams. • Represent probability situations using probability trees.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
NUMBER & OPERATIONS	NUMBER AND NUMERATION	
	1. Read and write whole numbers and decimals; identify places in such numbers and the values of the digits in those places; use expanded notation, number-and-word notation, exponential notation, and scientific notation to represent whole numbers and decimals.	<ul style="list-style-type: none"> • Convert powers and word names for numbers to decimals. • Multiply powers of ten. • Write numbers in scientific notation. • Know the definition of rational numbers. • Recognize whether numbers are written in scientific notation. • Understand uses of rational numbers in real situations. • Correctly use the raised-bar symbol for repeating decimals. • Identify the following types of numbers by their characteristics: real numbers, rational numbers, irrational numbers, positive numbers, negative numbers, integers, whole numbers, odd numbers, even numbers, and prime numbers.
	2. Solve problems involving percents and discounts; explain strategies used; identify the unit whole in situations involving fractions, decimals, and percents.	<ul style="list-style-type: none"> • Calculate the percent of a quantity. • Answer questions involving percents and combined percents.
	4. Apply the order of operations to numerical expressions to give equivalent names for rational numbers.	<ul style="list-style-type: none"> • Know and apply the Substitution Principle.
	5. Find equivalent fractions and fractions in simplest form by applying multiplication and division rules and concepts from number theory; convert between fractions, mixed numbers, decimals, and percents.	<ul style="list-style-type: none"> • Convert among decimals, fractions, and percents. • Use fractions to answer questions in real situations. • Use the Equal-Fractions Property to rewrite fractions. • Know and apply the Substitution Principle.
	6. Choose and apply strategies for comparing and ordering rational numbers; explain those choices and strategies.	<ul style="list-style-type: none"> • Use $<$ and $>$ symbols to compare or order numbers. • Graph and read numbers on a number line. • Calculate absolute value. • Order and compare decimals and fractions. • Graph addition and subtraction of positive and negative numbers using arrows on a number line. • Write intervals using double inequalities, the \pm sign, and absolute value.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
NUMBER & OPERATIONS	OPERATIONS AND COMPUTATION	
	1. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the addition and subtraction of whole numbers, decimals, and signed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Perform arithmetic operations. • Interpret situations with two directions as positive, negative, or zero. • Add and subtract positive and negative numbers. • Use the Putting-Together and Slide Models for Addition to describe situations leading to addition. • Use the Take-Away and Comparison Models for Subtraction to describe situations leading to subtraction. • Use fact triangles to depict relationships between numbers. • Graph addition and subtraction of positive and negative numbers using arrows on a number line.
	2. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the multiplication and division of whole numbers, decimals, and signed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Perform arithmetic operations. • Multiply powers of ten. • Round any number up, down, or to the nearest value of a fractional or decimal place. • Picture multiplication using arrays or area. • Multiply positive and negative numbers. • Divide fractions with numbers or variables. • Divide positive and negative numbers. • Know related facts of multiplication and division. • Know the general properties for dividing positive and negative numbers. • Use integer division in real-world situations. • Use the Rate Model for Division. • Use the Ratio-Comparison Model for Division. • Represent multiplication and division related facts with a fact triangle.
	3. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the addition and subtraction of fractions and mixed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Perform arithmetic operations. • Add and subtract fractions. • Use fractions to answer questions in real situations. • Use fact triangles to depict relationships between numbers.
	4. Use mental arithmetic, paper-and-pencil algorithms, and calculators to solve problems involving the multiplication and division of fractions and mixed numbers; describe the strategies used and explain how they work.	<ul style="list-style-type: none"> • Perform arithmetic operations. • Use fractions to answer questions in real situations. • Multiply fractions.
	5. Make reasonable estimates for whole number, decimal, fraction, and mixed number addition, subtraction, multiplication, and division problems; explain how the estimates were obtained.	<ul style="list-style-type: none"> • Deal with estimates in real situations.
	6. Use ratios and scaling to model size changes and to solve size-change problems; represent ratios as fractions, percents, and decimals, and using a colon; model and solve problems involving part-to-whole and part-to-part ratios; model rate and ratio number stories with proportions; use and explain cross multiplication and other strategies to solve proportions.	<ul style="list-style-type: none"> • Apply the Size-Change Model for Multiplication in real-world situations. • Apply the Rate-Factor Model for Multiplication. • Use the Ratio-Comparison Model for Division. • Recognize the Means-Extremes Property and know why it works. • Recognize and solve problems involving proportions in real-world situations.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
ALGEBRA	PATTERNS, FUNCTIONS, AND ALGEBRA	
	1. Extend, describe, and create numeric patterns; describe rules for patterns and use them to solve problems; represent patterns and rules using algebraic notation; represent functions using words, algebraic notation, tables, and graphs; translate from one representation to another and use representations to solve problems involving functions.	<ul style="list-style-type: none"> • Write a numerical or algebraic expression for an English expression involving arithmetic operations. • Given instances of a pattern, write a description of the pattern using variables. • Give instances of a pattern described with variables. • Given instances of a real-world pattern, write a description of the pattern using variables. • Represent a relationship between two variables using a table. • Estimate the square root of a number to a stated decimal place. • Determine the union and intersection of sets. • Write if-then statements and their converses. • Use Venn diagrams and hierarchies to describe relationships among sets. • Use square roots in real situations. • Apply the geometric definition of square root.
	2. Determine whether equalities and inequalities are true or false; solve open number sentences and explain the solutions; use a pan-balance model to solve linear equations in one or two unknowns; use trial-and-error and equivalent equations strategies to solve linear equations in one unknown.	<ul style="list-style-type: none"> • Evaluate algebraic expressions given the values of all variables in them. • Find solutions to equations and inequalities involving simple arithmetic. • Calculate the value of a variable given the values of other variables in a formula. • Graph solutions to simple inequalities. • Solve equations of the form $x + a = b$ and inequalities $x + a < b$. • Graph solutions to equations of the form $x + y = k$ or $x - y = k$. • Solve and check equations of the form $ax = b$ and $ax + b = c$. • Solve and check inequalities of the form $ax + b < c$. • Find unknowns in real situations involving multiplication. • Solve inequalities arising from real situations. • Graph equations of the form $y = ax + b$. • Solve equations and inequalities using the Division Property of Equality and the Division Property of Inequality. • Solve equations of the form $ax + b = cx + d$. • Solve inequalities of the form $ax + b < cx + d$. • Translate situation of constant increase or decrease that lead to sentences of the form $ax + b = cx + d$ or $ax + b < cx + d$. • Translate situations of linear combinations that lead to sentences of the form $Ax + By = C$ and $Ax + By < C$. • Graph inequalities of the form $y < ax + b$. • Graph sentences of the form $ax + by = c$ and $ax + by < c$. • Graph situations involving time and distance. • Graph a formula.
	3. Describe and apply the conventional order of operations.	<ul style="list-style-type: none"> • Use grouping symbols and the rules for the order of operations to evaluate numerical expressions.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
ALGEBRA	PATTERNS, FUNCTIONS, AND ALGEBRA	
	4. Describe and apply properties of arithmetic and multiplicative and additive inverses.	<ul style="list-style-type: none"> • Apply the following properties: Additive Identity Property, Property of Opposites, and Opposite of Opposites Property. • Apply properties of addition and subtraction to simplify expressions. • Recognize uses of the Commutative and Associative Properties of Addition and the Addition Property of Equality. • Recognize and use the Distributive Property and the Commutative and Associative Properties of Multiplication. • Represent the Distributive Property with areas of rectangles. • Recognize and use the Repeated Addition Property of Multiplication, The Multiplication Properties of 0, 1, -1, and positive and negative numbers. • Recognize and use the Multiplication Properties of Equality and Inequality. • Know the general properties for dividing positive and negative numbers.
GEOMETRY	GEOMETRY	
	1. Identify, describe, classify, name, and draw angles; determine angle measures by applying properties of orientations of angles and of sums of angle measures in triangles and quadrangles.	<ul style="list-style-type: none"> • Calculate magnitudes of turns given angle measures or revolutions. • Use the Triangle-Sum Property to find measures of angles. • Use properties of lines and angles to determine angle measures. • Explain consequences of the Triangle-Sum Property. • Use angle properties in everyday situations.
	2. Identify and describe similar and congruent figures and describe their properties; construct a figure that is congruent to another figure using compass and straightedge.	<ul style="list-style-type: none"> • Draw and identify basic figures of geometry and polygons. • Apply the definition of polygon to various figures. • Construct triangles using a compass and a straightedge. • Use the Triangle Inequality to approximate lengths of the third side of a triangle given the lengths of the other two sides. • Understand and use properties of parallelograms. • Find missing lengths in similar figures. • Apply properties of planes. • Apply the properties of prisms. • Describe unions and intersections of inequalities geometrically. • Draw and identify nets of prisms and cylinders. • Give views of a figure from the top, sides, or front. • From 2-dimensional views of a figure, determine properties of the 3-dimensional figure. • Use the relationships among sides, areas, and volumes of similar figures to predict length, perimeter, area, and volume. • Use relationships among sides, areas, and volumes of similar figures in real-world situations.
	3. Identify, describe, and sketch (including plotting on the coordinate plane) instances of reflections, translations, and rotations.	<ul style="list-style-type: none"> • Reflect figures over a line. • Draw the rotation image of a point or figure. • Create tessellations of polygons. • Determine reflection and rotation symmetries of a figure. • Perform expansions or contractions on a coordinate graph. • Perform expansions or contractions with negative magnitudes on a coordinate graph. • Translate and reflect figures on a coordinate graph.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
MEASUREMENT	MEASUREMENT AND REFERENCE FRAMES	
	2. Choose and use appropriate formulas to calculate the circumference of circles and to solve area, perimeter, and volume problems.	<ul style="list-style-type: none"> • Find the length of the hypotenuse of a right triangle using the Pythagorean Theorem. • Use the Pythagorean Theorem to find distances in real situations. • Use a calculator or spreadsheet to construct formulas and apply them to real-life situations. • Find the area of a triangle given appropriate dimensions. • Find the area of a trapezoid (including special types) given appropriate dimensions. • Find the area and circumference of a circle. • Recognize the differences between perimeter and area. • Find areas of rectangles and the number of elements in rectangular arrays in applied situations. • Find areas of triangles or trapezoids in real situations. • Find the area and circumference of a circle in real-world situations. • Use the relationships among sides, areas, and volumes of similar figures to predict length, perimeter, area, and volume. • Find the volume and surface area of a rectangular solid in real situations. • Find the volume and surface area of cylinders and prisms in real situations. • Use the formulas for the surface area and volume of a sphere in real situations. • Use relationships among sides, areas, and volumes of similar figures in real-world situations. • Find the surface area and volume of cylinders and prisms. • Calculate the surface area and volume of a sphere.
	3. Use ordered pairs of numbers to name, locate, and plot points in all four quadrants of a coordinate grid.	<ul style="list-style-type: none"> • Know the structure of the coordinate grid and how to represent data on it. • Graph and read numbers on number lines and coordinate grids. • Calculate the distance between two points on the coordinate plane.

NCTM Strand	Everyday Mathematics Grade 6 Grade-Level Goals	Transition Mathematics SPUR Objectives
DATA ANALYSIS & PROBABILITY	DATA AND CHANCE	
	1. Collect and organize data or use given data to create bar, line, circle, and stem-and-leaf graphs with reasonable titles, labels, keys, and intervals.	<ul style="list-style-type: none"> • Interpret information displayed in bar graphs, circle graphs, histograms, and stem-and-leaf displays. • Use tolerance to determine the interval of a measurement that is based on measures that are themselves in an interval. • Represent numerical data in a stem-and-leaf display. • Represent numerical data in a histogram. • Draw and interpret a box plot of a given data. • Represent trends in data over time.
	2. Use the minimum, range, median, mode, and mean and graphs to ask and answer questions, draw conclusions, and make predictions; compare and contrast the median and mean of a data set.	<ul style="list-style-type: none"> • Interpret information from scatterplots. • Calculate the mean absolute deviation of a set of numbers. • Calculate the five-number summary of a distribution of numbers. • Apply the Means and Sums Property and the Balance Property of the Mean. • Interpret information displayed in bar graphs, circle graphs, histograms, and stem-and-leaf displays. • Use the properties of means to find values in real-world situations. • Use rates of change to understand how data vary over time and to make predictions.
	3. Use the Multiplication Counting Principle, tree diagrams, and other counting strategies to identify all possible outcomes for a situation; predict results of experiments, test the predictions using manipulatives, and summarize the findings; compare predictions based on theoretical probability with experimental results; calculate probabilities and express them as fractions, decimals, and percents; explain how sample size affects results; use the results to predict future events.	<ul style="list-style-type: none"> • Calculate probabilities involving mutually exclusive events. • Identify statements as always, sometimes but not always, or never true. • Calculate probabilities involving mutually exclusive events or events with overlap. • Apply the hierarchies and Venn diagrams to real-world situations. • Calculate probabilities of independent events.

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